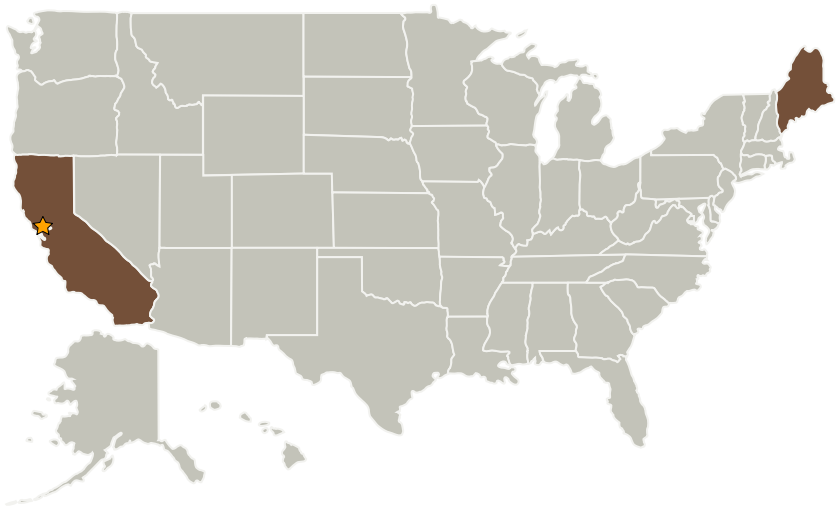
Advanced Thermal Protection Systems (ATPS), Aerospace Grade Carbon Bonded Carbon Fiber Material, Phase II

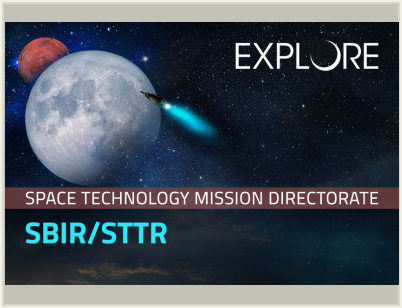
Completed Technology Project (2005 - 2007)

Project Introduction

Carbon bonded carbon fiber (CBCF) insulating material is the basis for several highly successful NASA developed thermal protection systems (TPS). Included among these innovative TPS are: PICA, (phenolic impregnated carbonaceous ablator), TUFROC (Toughened Uni-piece Fibrous Reinforced Oxidation-resistant Composite) and Genesis. PICA is currently employed on the Stardust Discovery Mission and also under consideration for CEV. NASA-Ames has a patent pending concerning TUFROC and the technology is planned for transfer to Boeing for fabrication of the X-37 leading edge. CBCF utilized in the above mentioned TPS systems is an attractive substrate material because of its low density and high porosity, superior thermal performance, and compatibility with other components. In addition, it is low cost because of the commercial market it also serves. However, the current CBCF manufacturing process does not produce materials engineered to the specifications NASA desires to put in place. These emerging and highly innovative TPS designs require material manufactured to specification. This Phase II program will demonstrate advanced processes and manufacturing approaches to consistently fabricate CBCF that meets desired technical specifications. The benefits derived include significantly improved flexibility for the TPS design engineer, as well as, more cost efficient CBCF derived TPS fabrication.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Ames Research Center(ARC)	Lead Organization	NASA Center	Moffett Field, California
Fiber Materials, Inc.	Supporting Organization	Industry	Biddeford, Maine

Primary U.S. Work Locations	
California	Maine

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX14 Thermal Management Systems
  - TX14.3 Thermal Protection Components and Systems
    - TX14.3.1 Thermal Protection Materials